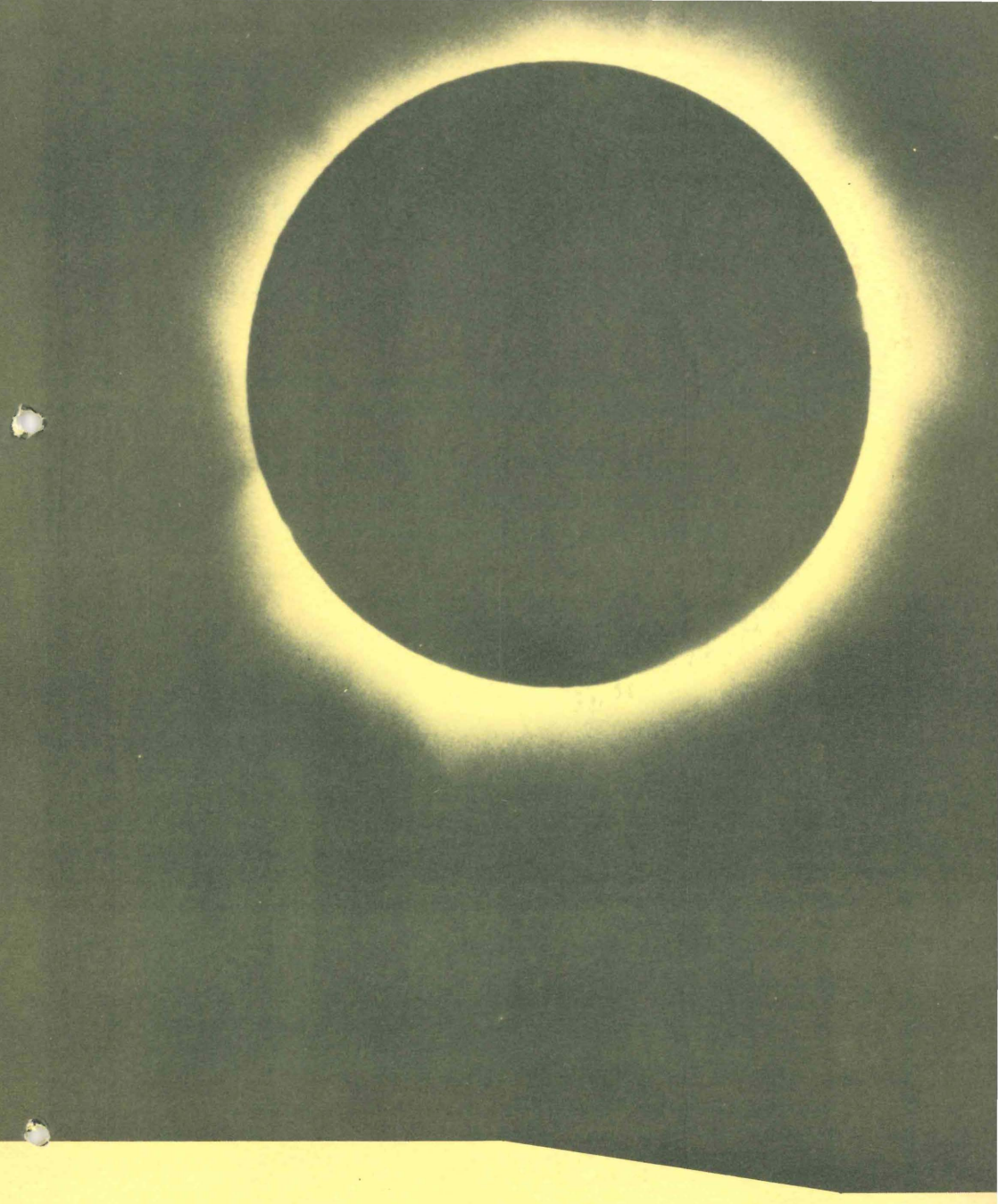

Naturalist Notebook

February-March 1974

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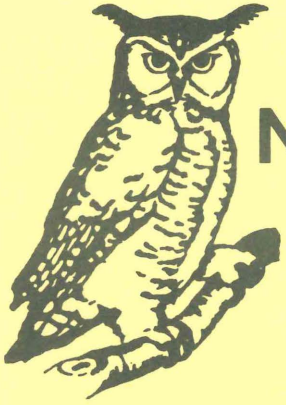

Naturalist Notebook

February-March 1974

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Oliver Denison

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In this February-March issue, we greet Spring 1974—and with energy that was stored throughout the winter we start anew!

Our days longer, the osprey nesting, red-winged blackbirds calling from the swamp, skunk cabbage in flower, and spring peepers singing—what better starting place for some thoughts on energy!

Energy at work! Katie Beal (left) and Mimi deGange (right), Junior Curators at the TSC show us the nature of human energy at work. They are loading 25-pound bags of sunflower seed into the car of a TSC customer. It was in thinking about moving objects (such as the sunflower seeds) that man first began to conceive of energy as the prime mover of the universe. These youthful smiling faces, mastering energy as the ability to do work with joy shown in their faces, represent the force that will lead us to a better and happier world.

THE ENERGY CRISIS IN PERSPECTIVE

Text by Richard H. Goodwin
Illustrations by Gainor Akin

As we put on an extra sweater, worry about whether $2 of gas at 51¢ a gallon will get us to our next appointment, and read rumors of fuel stockpiling, price manipulation, and electric rate hikes, it may be well for us to ask ourselves what the true cost of power really is. Perhaps the best consequence of the energy shortage may be stimulating people to reappraise our extravagant way of life. After all, the per capita use of energy in these United States is substantially higher than elsewhere in the world.

What is the true cost of power? Unfortunately, it is not measured solely by the cash flow at the gas pump or through the billing department of a utility. The true cost must include what it takes to avoid the adverse environmental impacts of energy production that erode our present quality of life and blemish the legacy we bequeath to our descendants. How often do we consider the immediate effects of smog upon the health of people and agricultural crops, the loss of beautiful country by stripmining, the destruction of marine fisheries and bird life by oil spills, the degradation of water resources by fly ash and thermal pollution, and the contamination of the biosphere with radioactivity?

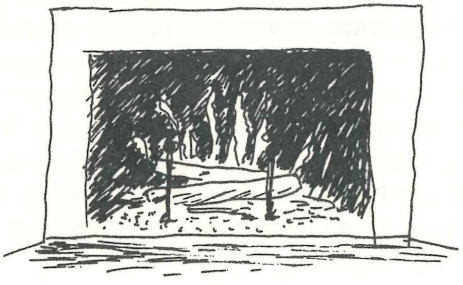
But perhaps even more important, what of the future? Fossil fuel supplies (oil, natural gas and coal) are limited. Once used up, they are gone forever. So are the sources of uranium. The slap-happy way we promote the peaceful atom completely evades the future cost of safely handling the deadly radioactive wastes of a nuclear reactor. We are accumulating today millions of gallons of lethal material that must be stored for thousands of years in order to preserve the safety of the environment. Will our children thank us for this heritage?

The fantastic aspect of this story is that a technology is at hand to tap a renewable energy source far greater than those provided by the fossil fuels and the atom, and one that can be environmentally safe to use. This is energy from the sun. Green plants have been utilizing it almost since life began to develop on this planet some two billion years ago; and as inhabitants of the Earth, we will continue to utilize it as long as we derive our food from agricultural activities.

Power to heat and light our houses and run our cars and industries can also be derived from this source. In colonial times wood fires, windmills and water wheels provided this energy. These are all powered indirectly by the sun. What about today?

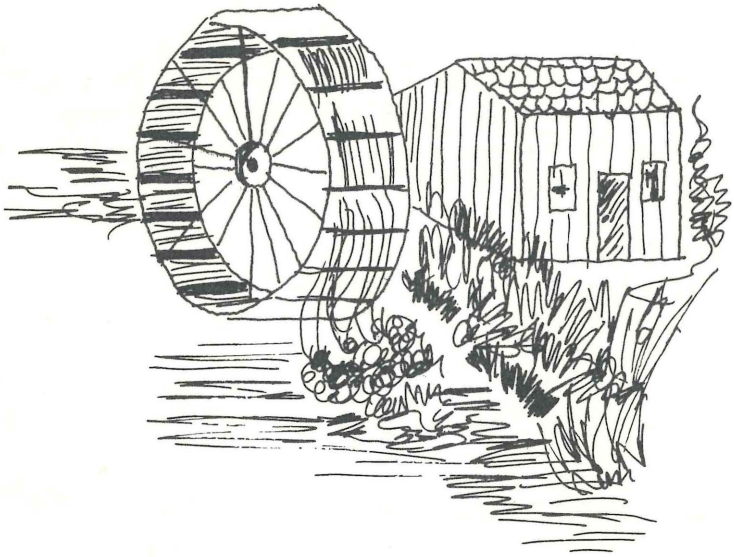
There are presently a number of fascinating schemes for developing solar power. First is the solar-heated house that directly converts the sun's radiation, absorbed on the roof, into heat. Solar-heated houses have now been in successful operation for a number of years in such scattered localities as Arizona, the District of Columbia, and Massachusetts; and more are now in construction—one of them in Westbrook, Connecticut. They are very carefully insulated to minimize heat loss and contain various devices for storing excess heat captured during daylight hours for later release.

Second is the solar cell that converts solar radiation directly into electricity. (This "solar battery" is already in extensive use on space vehicles and in special earthbound applications.) This can be expanded directly or stored in a battery for subsequent use. Although expensive to make at the present time, the possibility exists of greatly reducing the cost of manufacturing these devices in bulk.



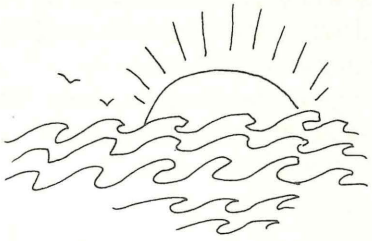
Third is a greatly expanded exploitation of wind power, which is especially available in certain parts of the world, such as just off the Atlantic coast at the foot of the eastern slope of the Rockies. it has been suggested that large aerodynamically efficient windmills be mounted on "Texas Towers" about 20 miles off the New England shore on the continental shelf which could provide all the power needed, even at our present extravagant levels of consumption, within a 200-mile wide coastal strip. The electricity generated on about 150 of these towers would be used to hydrolyze water (H_2O) into hydrogen and oxygen. The hydrogen would then be stored in submerged tanks and transmitted to shore in pipelines laid on the ocean bottom. Energy would then be released where needed by combustion of the hydrogen to produce heat or electricity. The by-product would be pure water, produced where it is in short supply—in the urban centers.

Fourth is the derivation of electricity from the temperature differential between the warm water of the Gulf Stream and the adjacent Arctic current. The system is basically a low-temperature steam engine. At low pressure the warm tropical water would boil and the vapor would drive a low-speed turbine. The cold Arctic water would then condense the expanded water vapor. This is a little exercise in physics for the curious student!



One small ray of encouragement in the energy picture may be seen in the federal appropriation of a few million dollars to be spent by the National Science Foundation in research on solar energy production. But this is pathetic support in the face of billions now being proposed to "solar" the energy crisis. The time is now for man to turn to viable approaches to the development of long-range energy sources. Too long have we destroyed our magnificent heritage to the vast profit of a few. In the long pull, everyone stands to lose.

THERE IS SOMETHING NEW UNDER THE SUN!



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Skinner, Brian J. Earth Resources. Prentice-Hall, 1969.

Sterland, E.G. Energy into Power: The Story of Man and Machines. The Natural History Press, 1967.

For the gadgeteer, the Thames Science Center recommends two books by D.C. Halacy, Jr.:

Experiments with Solar Energy. W.W. Norton & Company, 1969 (junior high).

Fun with the Sun. W.W. Norton & Company, 1959 (elementary and up).

These two books are well illustrated with photographs and detailed diagrams from simple reflector cookers and bakers to complicated solar-powered motors.

The simplest motor of all—a radiometer—can be bought at the TSC Store. This instrument, fascinating to watch, demonstrates the transformation of radiant energy into mechanical work. When the light strikes the black and white vanes in the exhausted glass bulb, it causes the delicately balanced vanes to spin, proving the physical energy of light.

Information you need on energy can be quickly tracked down using The Energy Index, billed as a "select guide to energy information since 1970" by the publishers, Environment Information Center, 124 East 39 Street, New York City 10016. The 400-page compendium provides access to more than 2,000 energy-related documents, includes maps and statistics on power consumption and energy reserves, contains transcripts of major laws and policies, lists energy books in print, films and patents. The index costs $37.50 from EIC at the above address.

Groton, New London, Waterford: Two PURPLE SANDPIPERS were seen at Waterford Beach in early December and will probably remain along the Connecticut shore throughout the winter months. The earliest record for FOX SPARROWS this year was December 4, when two were found in Waterford. A RED-THROATED LOON was seen at Waterford Beach December 10. A pair of wintering CAROLINA WRENS were observed in New London December 11. A most unusual number of CARDINALS (20) was seen in a single tree in Groton December 17. December 29 proved to be an interesting day for birders who made the following observations: 16 GADWALL DUCKS and 1 BONAPARTE'S GULL at Harkness Park; 25 PINE SISKINS, 6 GOLDEN-CROWNED KINGLETS, 2 GREATER YELLOWLEGS and a BLACK-BELLIED PLOVER in Waterford, and a KILLDEER in New London. The first two days of the new year provided the following interesting notes: 2 GREAT BLUE HERONS and 2 WATER PIPITS at Harkness Park, 2 BONAPARTE'S GULLS, 2 RUBY-CROWNED and GOLDEN-CROWNED KINGLETS in Waterford. Four FOX SPARROWS were found in Waterford January 4 and two KILLDEER were seen at Harkness Park January 6.

Gales Ferry: Seven PINE SISKINS were seen on January 7. The following observations were made at the Vinegar Hill area on January 12: a CAROLINA WREN, RED-BELLIED WOODPECKER, BROWN THRASHER, and MOCKINGBIRD.

Stonington: Three ROUGH-LEGGED HAWKS were observed in this area on January 2. Numerous species of waterfowl could be seen from the Barn Island boat launch area.

Niantic, Old Lyme: Over 100 CANADA GEESE were observed throughout December on the Niantic River. Birding at Rocky Neck State Park December 30 produced the following: 17 GREAT BLUE-HERONS, a SNOW GOOSE, 15 GADWALL, and 2 HOODED MERGANSERS. A MOCKINGBIRD and ROBIN were seen in the Laurel Hill area of Niantic during the first week of the new year. Ten to twenty PINE SISKINS have been coming to feeders daily since the new year began in Old Lyme.

Observers: Mrs. Austin, Grace Bissell, Mr. and Mrs. I. Goldman, Frank Haeni, Mrs. B. Lehman, Mrs. S. White, Mrs. C. Wood.

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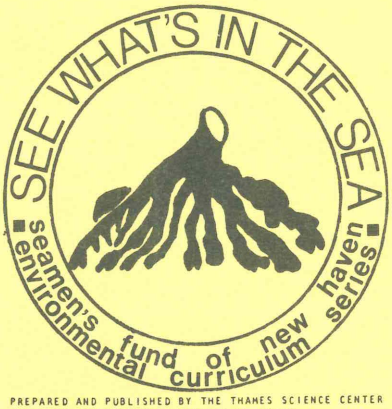

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